IMPERIAL
DEPARTMENT OF AGRICULTURE
FOR THE WEST INDIES

IMPERIAL BUREAU
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REPORT

ON THE

AGRICULTURAL DEPARTMENT

ANTIGUA.

1924-25 to 1927-28.

ISSUED BY THE IMPERIAL COMMISSIONER OF AGRICULTURE
FOR THE WEST INDIES.

1929.

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[Price Sixpence.]

LETTER OF TRANSMITTAL.

Trinidad.

C. A. 150

6th May, 1929.

Sir,

I have the honour to transmit herewith Reports on the Departments of Agriculture in the Leeward Islands as follows:—

(a) Report on the Federal Department of Agriculture for the years 1924-25, 1925-.6, 1926-27 and 1927-28.

(b) Report on the Agricultural Department, Antigua, for the years 1924-25, 1925-26, 1926-27 and 1927-28.

(c) Report on the Agricultural Department, Virgin Islands for the years 1923-24, 1924-25, 1925-26, 1926-27 and 1927-28.

2. For several years past no annual reports on the working of these Departments have been published. These Reports constitute an attempt to bridge the gap which has been thus created, by giving an indication of the main activities of these Departments during the past few years and up to March 31st, 1928.

3. The latest previous report in the case of Antigua was that for the year ended March 31st, 1924, and in the case of the Virgin Islands that for the year ended March 31st, 1923. Annual Reports on the working of the Federal Department were issued from 1911 to 1916, since which time these reports have been discontinued. The report submitted herewith covers the four-year period from April 1st, 1924 to March 31st, 1928. A gap still remains in this series of reports from 1916-17 to 1922-23, an interval of seven years.

4. Such annual reports form useful records of the work done by the Agricultural Departments and reviews of the agricultural situation in the several islands from year to year, and it is greatly to be hoped that they may appear regularly in the future. In addition to their value as records, the reports form a useful medium of exchange with other similar Departments, and by means of such exchanges Agricultural officers are enabled to keep in touch with the practical agricultural work being done in other places.

5. These reports have been kept down to a small size, and details which would ordinarily appear if they had appeared year by year are necessarily omitted. In general, however, they follow the lines of previous ones.

6. Attention may be directed to the statement to be found in the Antigua Section on Special Duties performed by Agricultural Officers. The list of these special duties is made up of activities which are essentially non-agricultural, and while, under the conditions existing in these islands, much of this work is of a kind best carried out by the Agricultural Departments, it would appear that in the case of the Antigua Agricultural Department so much of this kind of work has been required as seriously to interfere with the real work with which such a Department should principally be concerned.

7. Reference is also made to the effect on efficiency that results from frequent changes in the personnel of the Agricultural Staff, and the transference to the Department of Agriculture from other Departments of officers who have had no previous training in agriculture. The work of an Agricultural Department is specialized, and encouragement should be given to men to remain

in that service if they are interested and show an aptitude for the work. Training in other departments where the work is entirely, or even largely, clerical is not of itself preparation for agricultural work.

8. The decline in the cotton industry in the Virgin Islands is notable. At the same time the growing of tobacco and the manufacture of cigars is an interesting development, although the value of the exports of tobacco and cigars is still small. Charcoal, cattle, fruit and vegetables and small stock make the bulk of the value of the exports from the Virgin Islands, in each of the years reported upon.

9. During the four-year period under review the sugar industry in Antigua has made a record for yield. The crop in 1927 amounted to 23,195 tons of sugar. The crop of nearly 17,000 tons of sugar in 1925 was considered a very good one also. The amount of cotton produced in Antigua has varied greatly during this four-year period. The exports of cotton in 1924 is given as 750 lb. lint, in 1926 as 123,900 lb. lint, with an average annual amount for the four years of 64,725 lb.

10. The report on the Federal Department of Agriculture gives an indication of the large amount of analytical work done at the Government Laboratory by the Government Chemist and the Assistant Chemist. The visits to the several islands in the Leeward group consume a very large amount of the time of the Superintendent of Agriculture. They are of very considerable value in connection with the work of the local Department.

I have the honour to be,

Sir,

(Signed.) H. A. BALLOU.

Commissioner of Agriculture, Imperial College of Tropical Agriculture.

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REPORT ON THE AGRICULTURAL DEPARTMENT, ANTIGUA.

FOR THE PERIOD 1924—25 TO 1927—28.

The last report of the Antigua Department of Agriculture published was the report for the year 1923-24. The present publication represents an attempt to summarise the work of the Department for the past five years. During this period there have been several changes of office as regards the post of Agricultural Superintendent. In 1924 Mr. F. Harcourt, Agricultural Superintendent was on leave for seven months his duties being performed by Mr. F. H. S. Warneford, Federal Assistant Chemist. Shortly after Mr. Harcourt's return he was promoted to Dominica and Mr. H. G. Bell, Land Officer and Agricultural Instructor acted as Agricultural Superintendent until the appointment of Mr. A. W. Gallwey the present incumbent in September 1925.

Any attempt to condense the reports on five years work into one report must necessarily lead to the omission of many details which while of interest are not of sufficient importance to merit inclusion. It is proposed to recommence the issue of the annual reports in the season 1928-29.

The short report for 1924-25 has been drafted by the Federal Department of Agriculture: the report for the remaining years of the period under review was drafted by the Agricultural Superintendent in collaboration with the Federal Officers.

1924—25.

STAFF OF THE AGRICULTURAL DEPARTMENT.

Mr. F. Harcourt, Agricultural Superintendent was on leave in England from March 1924 until October of the same year. During his absence the work

of Agricultural Superintendent was carried out by Mr. F. H. S. Warneford, Assistant Government Chemist in conjunction with the duties of his substantive appointment.

The other members of the staff during this period were:

Land Officer and Agricultural Instructor—H. G. Bell.
1st Assistant for Agricultural Experiments—A. C. Thompson.
2nd Assistant for Agricultural Experiments—H. Hall and afterwards W. Sutherland
Clerk—Miss G. Edwards.
Cotton Inspector—T. H. Edwards, April, May and June.

PLANT AND SEED DISTRIBUTION.

During the year 1924-25 the following planting material was distributed:—

Plants.

Decorative	335
Mango	202
Orange and other citrus	56
Avocado pears	37
Eucalyptus	249
Mahogany	209
Sugar cane cuttings	111,400
Elephant grass cuttings	13,000
Onion seedlings	31,800
Unenumerated economic	243

Seeds.

Castor seed	20lb
Peas	370lb
Vegetable seeds	515 packets
Flower seeds	55 packets
Mahogany seeds	1lb

Work at the Botanic Station and in the Nurseries

The usual work of keeping the lawns and beds at the Botanic Gardens in good order was carried out throughout the year. The earlier months of the year were dry and few plants flowered while in August there was a hurricane which did considerable damage to the nurseries and to some of the ornamental trees.

The most important work in the nurseries consisted in the raising of casuarinas, eucalyptus, mahogany and other seedling trees, and in the care of budded mangoes and citrus fruit imported for planting on government land in suitable places in the Body Ponds valley and at the Fiennes wells.

An experiment was undertaken with tomatoes grown under light shade, but the beds and shelter were almost completely destroyed in the hurricane and the experiment was abandoned.

AGRICULTURAL PRODUCE EXPORTED.

The following table shows the chief agricultural products exported from the island during the year 1924:—

Articles.	Quantity.	Value.
Sugar, crystals	7,077 tons	£155,804
Molasses (vacuum pan)	351,140 galls.	4,390
Molasses (muscovado)	8,580 galls.	537
Cotton	750 lb.	66
Onions (crates)	860	562

Skerretts Experiment Station.

Plots of the following were grown during the year under review chiefly with the idea of providing planting material for distribution. Yams, eddoes and tannias, sweet potatoes and elephant grass. A plot of broom corn was grown to provide material for the manufacture of brooms by the inmates of the poor house.

Experimental plots of tobacco and of castor seed were cultivated but in both cases the results were disappointing. The returns from the castor seed plots were poor and the results indicated that with the ordinary market prices it would not be profitable to grow this crop under the conditions existing at Skerretts.

The tobacco grow well but the attacks of the tobacco worm did a considerable amount of damage although they were controlled by constant picking. Grasshoppers also were prevalent, tearing the leaves badly when the latter were approaching the stage of ripeness required for reaping and little or no control of these insects was effected although poisoned bait was tried.

Attempts were made to cure the leaves both at the Botanic Station and at the Government Laboratory. The only room at the Botanic Station available for this purpose was the tool shed—a room with a low unceiled galvanized iron roof quite unsuited for the purpose, the leaves drying too quickly for the necessary changes in colour and composition of the leaf to take place. Better results were obtained at the Government Laboratory but at neither place was it possible to ferment the small quantity of cured leaf obtained.

The burning qualities of the cured leaf were very poor, and on analysis the ash showed a large excess of chlorine as compared with the potash content—a condition of affairs which entirely accounted for the poor combustibility.

The soil at Skerretts is quite unsuitable for this crop, as later experiments with plots specially manured with sulphate of potash failed to show any great improvement in the quality of the leaf.

SYNTHETIC FARMYARD MANURE.

The Agricultural Developments Company have devised a process for the production of a synthetic farmward manure by the action of micro-organisms on plant residues in the presence of certain nitrogen compounds. An attempt was made to prepare some quantity of manure from cane trash and megass on lines somewhat similar to those adopted in the Adco process.

Cane trash and megass were mixed intimately with a little marl (calcium carbonate) and a small quantity of ammonium sulphate, the whole thoroughly moistened and made into a compact heap.

Each morning the heap was sprinkled with water to maintain the moisture content, and after a few days a marked rise of temperature was observed. The heaps were allowed to stand for three or four months at the end of which time the greater portion of the material had been broken down and possessed the appearance of well decomposed farmyard manure. Unfortunately the heap was in the open, there being no suitable shelter available, and was exposed to heavy rains during and immediately after the August hurricane; the result being such a loss of nitrogen (determined by analysis of the manure) as to render the process un-economical under the conditions of the experiment described.

LAND SETTLEMENT AND RENTED CROWN LANDS.

During the year under review work continued in connection with the land settlement schemes at Clare Hall and Sawcolts, and the initial instalments were paid by the allottees at Wallings.

The collection of rents from Crown lands situated at Skerrets, Body Ponds and Piccadilly was added to the duties of the Department during the year 1924 and a considerable portion of the time of the Land Officer was devoted to this work. The lack of definite contracts between the renters and the government, the scattered nature of the lands rented and the irregular shapes of certain of the plots together with the inability of many of the tenants to pay the rent when due added considerably to the magnitude of this task.

METEOROLOGICAL.

The following table shows the rainfall for the year 1924:—

RAINFALL FOR 1924.

January	2.28	inches.
February	1.18	„
March	0.46	„
April	2.09	„
May	4.46	„
June	3.16	„
July	4.09	„
August	9.64	„
September	5.36	„
October	6.62	„
November	4.70	„
December	5.79	„
Total	49.83	inches

AGRICULTURAL SHOW.

A successful Agricultural Show was held in February, 1925.

STAFF OF THE AGRICULTURAL DEPARTMENT, ANTIGUA, 1925-27.

1925–26.

Agricultural Superintendent	.. F. G. Harcourt, January to April.
Agricultural Superintendent (Acting) ..	.. H. G. Bell, April to September 27, 1925.
Agricultural Superintendent (Acting) ..	.. A. W. Gallwey, September 28, 1925, to April 1, 1926.
Land Officer and Agricultural Instructor ..	.. H. G. Bell.
1st Assistant for Agricultural Experiments	.. A. C. Thompson.
2nd Assistant for Agricultural Experiments	.. J. W. Sutherland.
Clerk	.. Miss G. Edwards.
Cotton Inspector	.. T. H. Edwards, April, May and June.

1926–27.

Agricultural Superintendent	.. A. W. Gallwey.
Agricultural Assistant	.. J. H. Allen. June, 1926.
Assistant Clerk	.. J. W. Sutherland.
Lady Clerk	.. Miss G. Edwards.
Cotton Inspector	.. T. H. Edwards, April, May and June.

1927–28.

Agricultural Superintendent	.. A. W. Gallwey.
Agricultural Assistant	.. J. H. Allen.
Assistant Clerk	.. H. St. J. S. Bell.
„ „	.. Miss G. Edwards, April to August.
„ „	.. Miss E. Bell, August to September.
„ „	.. J. M. Hallpike, October 17, to January 17, 1928.
Cotton Inspector	.. T. H. Edwards. April, May and June.

Since the assumption of the post of Agricultural Superintendent by the present incumbent, the working strength and potential energy of the staff has been reduced and also subsequently incapacitated by the transference to the Department of Officers from other Departments who have never had any Agricultural training.

1925—1927.

Work in the Botanic Gardens and Observations on Plants.

During the period under review 1925 was the fifth year in succession in which drought was experienced.

For the major portion of this year, the plant specimens in the garden suffered severely and presented a parched or burnt up appearance.

In 1926 and 1927 however the rains were better distributed, in consequence of which the decorative beds and borders were always masses of colour.

The following are the specimen trees in the Quarry which flowered on several occasions:—*Tecoma serratifolia, Lagerstroemia indica* (pink and purple varieties), *Poinciana regia* and *Jacaranda ovalifolia*.

In addition the following plants were observed to have flowered:—*Epiphyllum, Hookeri, Empress of Indian Lily, Plumbago capensis.*

Work in the Nurseries and Distribution of Plants

Another attempt was made in 1926—27 to raise further supplies of cane variety seedlings.

As stated in previous reports on this Station this work requires special housing accomodation for the protection of the young seedlings from the heavy downpours of rain which are usually experienced during the latter part of the year.

Several hundred seedlings were actually raised but were lost on account of the lack of proper accommodation and the inadequate means of dealing with them.

DISTRIBUTION OF PLANTING MATERIAL.

PLANTS AND SEEDLINGS.

	1925.	1926.	1927.	1928 to March 31.
Lime	47	..	3,310	100
Mango ..	129	121	338	17
Eucalyptus	64	56	27	148
Decorative ..	468	656	512	509
Pears ..	5	21	165	9
White Cedar ..	..	40		
Papaw	36	60	..	1
Guava ..	..	53	70	29
Mahogany ..	41	58		
Coconut ..	..	..	1,357	20
Fruit Trees ..	238	..	32	..
Nutmeg ..	..	..	6	..
Grape	2	7	3	..
Casuarina ..	107	232	118	675
Onion	42,850	11,600	200	..
Unclassified Economic	..	12	16	395

CUTTINGS.

Sugar Cane ..	111,500	69,800	68,020	1,500
Gliricidia	..	6	51	..
Bamboo ..	..	12		
Guatemala Grass ..	100	..	540	..

SEEDS.

Onion		463 lb.		
Vegetable	455 pks.	658 pks.	240 pks.	19 pks.
Flower	2 pks.	40 pks.	2 pks.	
Yam	1,141 lb.		200 lb	
Cotton		16,170 lb	1,239 lb.	
Musk Ochro			7 lb.	
Castor	750 lb.		50 lb.	
Bread and Cheese		21 lb	17 lb.	

AGRICULTURAL EXPORTS.

The following table shows the agricultural products exported from the island during the period under review:—

Article.	1925.		1926.		1927.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Sugar	16,996 tons.	£14.15.5 per ton.	12,196 tons	£13.14.11 per ton.	23,195 tons	£ 16.6.3 per ton.
Sugar(muscovado)			26 „			
Molasses			393,178 gals		715,377 gals	
Fancy Syrup ...					36,454 „	
Cotton (lint) ...	37,250 lb.		123,900 lb.		97.000 lb.	
Cotton (seed) ...			103,600 „		60,480 „	
Tamarinds ...			537 „		115,800 „	£309.0.0
Lime Juice. (con.)	500 gals.		2,050 gals.		5,250 gals.	
Lime Juice (raw)			2,950 „			
Lime Oil ...					144 „	£1,620.0.0
Green limes (fruit)			87 bls.		81 bls.	
Onions	362,950 lb.		46,750 lb.		66,500 lb.	
Seed work ...		£1,335		£391		£15
Hides and Skins ...				£269		£314

LIVE STOCK.

Horses	28	£ 280	15	£201	13	£130
Cattle	5	40	1	6	31	465
Asses	148	155	136	83	91	30
Dogs			92	5		
Sheep					4	2
Swine	5	5	2	1	..	..

PLANT AND SEED IMPORTATION.

The principal planting material which was brought to the island in 1928 was a collection of P.O.J. cane varieties from Trinidad. These were imported by the authorities of Gunthorpes Estates Ltd. The varieties so imported were P.O.J. 213 P.O.J. 2714, P.O.J. 2721, P.O.J. 36 and P.O.J. 234. Special care was taken with the importation to prevent the introduction of Frog hopper from Trinidad.

The following introductions are worthy of comment:—

Ceratonia Siliqua. (*Carob bean*). Seeds of this plant were received from Kew in 1925 and germinated well. The young seedlings at the time of writing (3 years after) are only 9—12 inches in height which shows the slow growing habit of this plant in this climate.

Dombeya punctata. Cuttings of this ornamental tree were received through the Superintendent of Agriculture from the Botanic Gardens at Dominica. Specimens were set out in the Quarry and have flowered on several occasions.

Phytolacca dioica. (*Bella sombra*). Seeds of this shade tree were received through the Superintendent of Agriculture from Paris. Germination was somewhat slow but several plants have been raised and distributed.

Celtis Sinensis. Seeds of this plant were received through the same source as the former. They never germinated though several methods of encouraging growth were tried such as filing down the hard seed coat, steeping in sulphuric acid, parching to overcome dormancy etc.

Hibiscus Abelmoschus (Musk ochro). Seeds of this plant were obtained through the Superintendent of Agriculture. Germination was good.

Hynocarpus Wightiana (*Marotti*). Three seeds of this highly interesting plant were received through the Superintendent of Agriculture. Two germinated and the plants are now 2½—3 inches in height. It is proposed to plant them along the stream at Swetes reservoir. The oil from the seeds of this plant is alleged to be a permanent cure for leprosy.

Enterolobium cyclocarpum. Seeds of this shade tree were received from the Agricultural Superintendent, St. Kitts. Several plants have been raised and distributed.

In addition several importations of planting material of a decorative nature were made from the neighbouring islands to plant up the beauty spots of Antigua.

Plot Experiments at Skerretts Experimental Station.

COTTON.

A serious attempt to establish continuous selection work with cotton was started in 1925.

When the present writer took up the duties of Agricultural Superintendent it was discovered that no real plant breeding work with cotton was being carried out.

At the time there were three types of cotton under cultivation on estates throughout the island viz., Antigua, Montserrat and Barbados types. The growth and behaviour of the three types were carefully studied and the conclusion arrived at was that the Montserrat type H. 23—2—13 was far the most prolific bearer and possessed the best lint characters.

Selections were therefore made of individual plants in a commercial field of the Montserrat type grown at Blubber Valley estate; the selections being in the first instance based upon field characters.

In 1926 the best of these selections were planted in progeny rows at Skerretts and at the time of flowering, self-fertilisation of flower buds was carried out. At the time of examination of these self-fertilised bolls more than two thirds of the seeds were found to have been badly damaged by the pink boll worm.

It was therefore decided to pick out such few selfed seeds from each of the selections as appeared fertile and viable, bulk the same and replant a plot in 1927 with this seed.

This plot was planted on September 23 and self fertilised in December but at the time of examination the seeds were so heavily infested with pink boll worm that the examination of the lint was unpracticable. It was therefore decided to plant unselected seed of this type in 1928 and recommence the work of selection.

Reverting to the Antigua and Barbados types mentioned in a previous section of the report seeds of each of these types were collected in 1925.

The Antigua type is known as the "Morris" cotton because it was through the courtesy of Mr. Ernest Dew who had grown this cotton at Morris estate for a number of years and who had tried to keep the strain pure that seeds of this type were obtained.

As regards the Barbados type growers in 1924 tried to improve the then existing types of cotton in the island by importing seed from Barbados through the Barbados Cotton Factory.

In 1925 selections were made from estate fields of these cottons and the seeds planted the next season. At the time of flowering self-fertilisation was carried out and the resulting seeds planted in 1927. 1927 was an usually wet year: there were severe attacks of the cotton worm, a heavy infestation with the pink boll worm and as was to be expected with heavy rains on the heavy clay soil of the Experiment Station considerable boll shedding. As a result of the unfavourable conditions practically all the self fertilised bolls were lost and investigation work with these strains has had to be started again from fresh material.

YAMS.

Ten varieties of yams were under experimentation during the years 1926 1927.

The following table gives the results obtained.

Varieties.	Calculated average yield per acre in lb	Calculated yield per acre in lb
	1926.	1927.
Seal Top	28,050	10,200
Bugle Horn	21,550	11,200
Lisbon	20,850	24,000
Oriental	25,450	11,300
Antigua Cush Cush ..	25,900	17,600
W. H. Yam, Dominica	18,550	7,800
Crop	22,350	17,100
Bottle Necked Lisbon..	23,000	14,300
Danish	23,400	11,000
Light Red	18,650	22,000

EDDOES AND TANNIAS.

Experimental plots of these vegetables were grown both in 1926 and 1927. In each season seven varieties were cultivated. The following table shows the yields obtained expressed as average returns per acre.

	1926.	1927.
Tannia Roliza	5,040 lb	9,875 lb
Tannia White	4,770 lb	7,980 lb
Tannia Priete	4,440 lb	2,340 lb
Tannia Beliza White ..	4,087 lb	2,340 lb
Tannia Yellow	4,107 lb	5,175 lb
Tannia Islena	2,662 lb	3,775lb
Red Eddoe	3,274 lb	1,500 lb

SWEET POTATOES.

Twenty eight varieites of Antigua sweet potatoes were planted in 1926. The results were exceedingly poor, the highest cropper being A. 6 with a return of 9,600 lb. per acre.

It was decided to abandon further trials with these varieties as from a producing standard they could never compare with the Barbados and Trinidad types which are well established over the island.

SOYA BEAN.

During the period under review a serious attempt was made to introduce into Antigua various types of Soya beans. It is well known that this legume is often difficult to establish on a soil on which it has not hitherto been grown owing to the absence of the particular strain of b. radicicola which can form root nodules on this plant. Accordingly an experiment was conducted at Skerretts in which a plot of soya beans from seed inoculated with Farmogerm (a commercial culture of the soya bean strain of b. radicicola) was compared with plants grown from untreated seed. In neither case was healthy growth observed and the return from the inoculated seed was less than from the untreated—the yield being:—Treated 322 lb. per acre and Untreated 412 lb per acre.

Under conditions at Skerretts Experiment Station it would appear that the texture of the soil exerted a greater influence than the absence or presence of the nodule forming organisms. Better results have since been obtained in experiments carried out by the owners on the light calcareous soils of Cedar Valley estate.

PINE APPLES.

A 1/32 acre plot of pine apples was planted in 1926 on the lightest and best drained soil in the Experiment Station. During 1927 the plot made good progress and started to set suckers. Early in 1928 the plants flowered and the number of fruit set promised a fair return later in the year.

The main reason for establishing this plot was in order to provide suckers for prospective planters and especially peasants.

ONIONS.

In May, 1926, onion seed imported in September, 1925, and stored for nine months at the Government Laboratory in air tight containers containing Calcium chlorde was sown on one plot at the Experiment Station and gave a good germination. The seedlings were healthy and vigorous: they were set out in June and reaped in October, the return being equivalent to 2,120 lb. per acre. Although this yield was disappointing the experiment showed that onions can be grown out of the usual season so as to meet the demands of the local market.

A plot was also planted with seed from the 1926 importation of seed. This gave a return of 718 lb. or a calculated yield of 7,180 lb. per acre. These onions were stored in the onion drying house with the idea of providing a source of supply after the large locally grown crop had been disposed of. The unusually wet weather experienced during the year 1927, however, proved too much for the keeping qualities of locally grown onions and they had to be disposed of in competition with the large local crop.

VILMORINS STRINGLESS BONAVIST BEANS.

Several plantings of this vegetable were made. This bean, if, when growth starts, is properly staked gives large crops. Residents appear to appreciate these beans by the large requests for them.

MISCELLANEOUS CROPS.

The following crops were also tried during the period under review but with no definite results worthy of record:—

Alfalfa, Hubam clover, sesamum, jute, musk ochro, and Jerusalem artichokes.

WORK IN CONNECTION WITH INSECT AND FUNGUS PESTS AND THEIR CONTROL.

SUGAR CANE.

With the advent of the planting season in 1926 the Department issued a leaflet describing the method which should be adopted in selecting planting material so as to reduce the chances of planting cuttings infected with Mosaic disease.

Rogueing of all ratoon fields was also advocated and was carried out to such a good effect that at the present time it may confidenty be stated that Mosaic disease has been practically eradicated in Antigua.

In 1925 Dr. Julius Matz, formerly Plant Pathologist of the Insular Experiment Station, Porto Rico, visited Skerretts Experiment Station and after an exhaustive examination of the sugar cane plots was unable to find any indications of the presence of gumming disease which he had recently detected in St. Kitts.

PARASITIC CONTROL OF THE SUGAR CANE MOTH BORER

During the year 1927 certain types of hymenopterous parasites of the sugar cane moth borer (Diatrea saccharalis) viz., the braconids ipobracum and microdus were introduced from British Guiana.

These insects possess long ovipositors which enable them to lay their eggs in the larvae of the moth borer while they are in their tunnels in the cane. The braconid larvae live within and destroy their hosts and instead of the moths issuing from the attacked cane their places are taken by the adult wasps whose larvae have consumed them. The adults feed on nectar or on dilute saccharine solution and in nature their food is the saccharine secretion of Cordia *interrupta* rupta or some other variety of cordia—in captivity they may be fed on sugar or honey.

The first introductions were made by Professor Ballou, M.Sc., Commissioner of Agriculture and Professor of Entomology at the Imperial College of Tropi-

cal Agriculture. The adult braconids were transferred immediately on arrival to a large cage containing sugar cane artificially attacked by the moth borer with the hope that they would oviposit in the larvae of the borer and that in this way it would be possible to establish a permanent breeding station for the parasites which could then be liberated in infected fields of cane. The breeding cage contained also wicks of absorbent cotton saturated with a saccharine solution to serve as nutriment for the adults during the period of oviposition or before liberation in the cane fields.

Unfortunately it was not possible to find very much infected material as a source of moth borer larvae at the time of these importations and moreover many of the larvae in the artificially infected cane perished, possibly owing to rapid drying of the canes. As a result of this while it was possible to keep the adult braconids alive for some time no success was obtained in breeding a second generation.

In the case of later importations (four consignments were received over a period of two months) the insects were liberated in fields of young cane which were at the most favourable stage for moth borer attacks. Insects were liberated at the following estates:—Collins, Gaynors, Cassada Garden, Millars, The Cotton, Gravenors, North Sound, Blubber Valley, Belvidere, Yeptons, Montpelier.

During the reaping season of 1927-28 fields in which parasites had been liberated were inspected. In no cases were any parasites found but an examination of the canes showed as a general rule a low percentage of infestation with moth borer although in the absence of careful examination of other fields where these parasites had not been liberated it is impossible definitely to attribute the small degree of infection to the beneficial action of these insects.

The following table shows the results of the examinations of the fields infected.

Estate.	Field.	Number Cane.	Variety examined.	% attacked by both borer.
Belvidere ..	Twelve Bed.	B.H. 10/12.	100	12.3
Yeptons ..	Carbay.	B. 6308.	100	25.3
Collins ..	No. 8.	S.C. 12/4.	100	5.1
Millars ..	No. 7.	S.C. 12/4	100	12.1
Blubber Valley	No. 2.	B. 6308	100	14.4
The Cotton ..	No. 5.	B.45996	100	2.1

In each field 100 canes were chosen at random and the total numbers of joints in each cane counted also those joints showing borer holes. In this way the number of infected joints in 100 canes was determined and expressed as a percentage of the total number of joints in 100 canes.

In addition to this field No. 5 at Gravenors and field No. 16 at Cassada Garden in which parasites had been liberated were carefully examined after the old canes had been reaped and the ratoon sprouts had made growth of 12—16 inches in height. Although the examination was made at a time when the moth borer attack is usually made the canes were found to be remarkably healthy.

It is proposed to follow up this work with further importations of parasites and in this connection the Attorneys of two large groups of estates have offered to stand all expenses incurred in the importation of several thousand parasites for liberation on the estates under their control. The question of the successful introduction of these insects into Antigua is however so intimately connected with the question of furnishing an adequate supply of food for the adults that planters cannot be too strongly urged to plant cordias if they desire to give the method of moth borer control a fair trial.

COTTON.

The cotton worm (*Alabama argillacea*) appeared during all seasons under review especially during 1926 and 1927 but was controlled by frequent dustings with paris green and lime.

The pink boll worm (*Platyedra gossypiella*) did considerable damage in 1926 and 1927. In these years the weather was particularly wet at the time when the young bolls were developing and these conditions appear to have favoured the spread of the pest.

PINK BOLL WORM INVESTIGATION.

An experiment was started in 1927 with a view of ascertaining the time at which the emergence of pink boll worm moths is at its maximum.

A grant was obtained from the Antigua Cotton Growers' Association for the erection of a moth proof wire cage (14 x 10 x 10 ft. with a wooden floor) in which were placed six boxes with cotton plants at the flowering stage and a source of infection in the form of old infected bolls, refuse, seed, etc. The general scheme of the experiment was based on the idea that as moths emerged from the infected material they would lay eggs in the young bolls on the growing plants and that by periodic examination of these bolls and determination of the degree of infection it would be possible to arrive at some idea of the period of year at which emergencies were most frequent. It was arranged to have a constant supply of young plants at the correct stage to take the place in the cage of those removed for examination and to prevent fluctuations in the number of larvae resting in the infected material affecting the results it was decided to place in the cage at the start of the experiment a sufficiently large quantity of infected material to allow of the emergence of a considerable number of moths.

At first the cage was placed in a rather shady situation which tended to prevent the cotton plants flowering and bolling but afterwards when placed in full sunlight the plants started to set bolls two examinations being made, one in February, 1928, and one in March, 1928.

The results appear below.

Examination for Infestation of Pink Boll Worm in Breeding Cage at Botanic Station

1927-28.

Date of Examination.	No. of bolls.	No. bolls punctuated.	No. bolls containing living larvæ.	No. bolls showing larval marks	% Infestation.
14 2 28	100	11	2	9	22·0
45 3 28	21	...	7	3	47·6

It is of course too early to draw any conclusions from this experiment which must be carefully conducted for two or three years before results of any significance can be expected.

ONIONS

Thrips were prevalent during 1926 and were responsible for considerable diminution of the onion crop. Several fields were also lost as the result of internal soft rot.

GENERAL.

Parasol Ant.

During 1926 it was discovered that an insect of the ant family was causing great damage to plants in the nursery. It was provisionally identified by the Superintendent of Agriculture as the parasol ant (*Atta octospinosa*) of Trinidad, this identification being subsequently confirmed by Professor Ballou. Prompt action was taken and the nests destroyed and treated with carbon disulphide. No plants were allowed to leave the Station for a period of three months when it was certain that these insects had all been destroyed.

Summary of Legislation Affecting Stock and Crops.

ANIMALS.

Swine Epidemic Act 3 of 1893. Gives extended power to Board of Health for the prevention of the spread of disease among animals.

City of St. John's By-law 13 of 1897. Registration of butchers and inspection of animals for slaughter of meat in market by Veterinary Surgeon and authorizes destruction of unwholesome food.

City of St. John's By-law 13 of 1899. City by-law for the purpose of dealing with cattle disease.

City of St. John's By-law 2 of 1911. Regulates the keeping of animals in municipal areas and inspection etc. of stables in the city.

Ordinance 7 of 1913. An ordinance to prohibit the introduction of mongoose into Barbuda.

Diseases of Animals Ordinance 16 of 1913. Repeals and amends the law relating to contagious diseases among animals. Animals and diseases clearly defined. Inspectors empowered to visit and inspect estate premises etc. for diseased animals and to ensure that provisions are carried out. Suspected animals to be examined by Veterinary Surgeon and on his (positive) report shall be slaughtered.

Cruelty to Animals Amendment Act 3 1919. Amends ..... Acts of 1880 and 1916 and provides a fine not exceeding £5 for anyone guilty of cruelty, beating, ill treating or starving any animal.

Diseases of Animals (Amendment) Ordinance 8, 1920. An ordinance to amend further the Diseases of Animals Ordinance 16 of 1913. States that the Governor may by Order-in-Council revoke amend or vary any Order-in-Council issued under the provisions of this section.

Ordinance 10 of 1922. The Animals Tax Ordinance. An ordinance to provide fo rthe taxation of certain animals (donkeys and horses).

Order-in-Council dated 19th. July., 1923 rescinds the Order-in-Council dated 29th. September 1922 prohibiting the landing of animals of any kind from St. Christopher and Nevis.

Order-in-Council dated 22nd. May 1924 under section 18 of the Diseases of Animals Ordinance 1913 prohibits the importation of all foreign animals when brought from the United Kingdam on account of *Foot and Mouth Disease.*

Ordinance 12 of 1925. The Exportation and Importation Prohibition Repeal Ordinance 1925 repeals The Exportation and Importation Prohibition Ordinance 1920 Re-Ordainment Ordinance 1924.

Ordinance 5 of 1927 amends Animals Tax Ordinance 10 of 1922 stating that if the Governor is satisfied that hardship results from the tax to remit or exempt such person from payment of the tax.

TURTLE. Ordinance 17 of 1927. An ordinance for the protection of turtles and tortoises.

MILK.

Adulteration Act 6 of 1884. Provides for the examination of milk and also fines for adulteration in the island of Antigua.

Statutory Rules & Orders No. 21 of 1927. Saint John's City Commissioners page 62 regulations for ensuring that milk sold or consumed within the city shall be pure, wholesome and free from adulteration.

PLANTS.

Plant Fumigation Ordinance 5 of 1905. To provide for the fumigation of plants imported into the Presidency.

Plant Protection Ordinance 16 of 1923. An ordinance for the prevention and eradication of diseases and pests affecting vegetation.

Proclamation of 6th October 1928 under Plant Protection Ordinance 16 of 1923 prohibits the importation except under license to be granted by the Governor of *SUGAR CANE* and *parts of sugar cane* from *ALL PLACES, BANANA plants and parts of banana plants including their fruits* from *British Guiana, Dutch Guiana, Central America or any island or place in the West Indies EXCEPT* Barbados and the other islands of the Leeward Islands Colony, *ROOTED PLANTS OF THE CITRUS FAMILY from the United States of America, Jamaica, Cuba, Haiti, and Santo Domingo* unless accompanied by a certificate signed by a responsible inspecting officer stating that the district from which such plants originate has not been affected by or has been free for the preceeding two years of citrus canker. *LIME PLANTS AND PARTS OF LIME PLANTS INCLUDING THEIR FRUITS* from *British Guiana, Trinidad, Dominica, St. Lucia, and St. Kitts. COTTON seed and seed cotton and all packages, coverings, bags, or other articles or things which have been used as packages, etc.,* or any *Cotton seed, lint cotton* or *seed cotton from all places, EXCEPT* small quantities of seed specially imported by the Agricultural Superintendent with approval of the Governor. *SPROUTED COCONUTS* from *Grenada, Trinidad and St. Vincent.*

AGRICULTURAL PRODUCTS.

The Produce Protection Ordinance 20 of 1922. All growers and sellers of produce to be licensed. Produce means cacao maize, coconuts, limes and wood the growth, produce or manufacture of the Presidency of Antigua.

Statutory Rules and Orders No. 11 of 1928 order in council dated April 16, 1928 adding *TAMARINDS* to the list of protected produce.

Order in Council of 13th. November 1922 adds *PINE APPLES AND ONIONS* to Produce Protection Ordinance 20 of 1922.

The Export Duty Ordinance 11 of 1926. An ordinance to impose a duty on sugar and its products exported from the Presidency of Antigua during 1927.

The Export Duty Ordinance (Continuance) 1927 *No. 24, of 1927* states that Export Duty Ordinance 1927 shall continue in force for one year until 31st day of December 1928.

CROPS.

SUGAR CANE.

Act 108 of 1850 prohibits the use of Acetate of Lead in the manufacture of sugar in the island of Antigua.

Proclamation dated 1st. June 1922 stating that license for the exportation of sugar is no longer necessary.

Proclamation dated 14th. April 1924 under Plant Protection Ordinance 16 of 1923 proclaiming Mosaic disease to be within the meaning of that ordinance.

Regulations made by Governor-in-Council dated 25th April 1924 stating (1) the expression "Owner" includes occupier and person in charge of any land and (2) owner to give notice in writing to Chief Inspector if he suspects existence of disease "Mosaic" and of the extent of the disease. (*Made under section 23 of the* Antigua Plant Protection Ordinance 16 of 1923.)

COTTON.

Cotton Traffic Ordinance 5 of 1906. Regulates local traffic in cotton. No person to sell cotton (or purchase) without a license, purchaser to keep a purchase book.

The Cotton Protection Ordinance 7 of 1922. An Ordinance to provide for the protection of cotton.

The Cotton Protection Amendment Ordinance 5 of 1926 states during close season as declared the provisions of the principal ordinance shall so far as they are applicable apply to such other plants in like manner as they apply to cotton plants.

The Cotton Protection Regulations 1926 dated March 22, 1926 made under Cotton Protection Ordinance 7 of 1922 giving Inspector without notice and at all reasonable times during a close season to enter upon any land for the purpose of ascertaining whether any ochro plants are growing or remaining on any such land during that season and may destroy all such plants found thereon.

Ordinance 8 of 1927 inserts in Cotton Protection Ordinance 7 of 1922 between sections 4 and 5 the following 4. (A) Any occupier who shall at any time dispose of any cotton plants or any part thereof other than seed cotton whether the same be growing or remaining on any land occupied by him by any means other than by *burning* shall be guilty of an offence.

Progress in the Chief Industries

Sugar.

As a result of the fair rainfall during 1924 (average 41.57 inches for the whole island) the 1925 crop was a good one. The Antigua Sugar Factory produced 14,626 tons and Bendals 2,370 tons making a total of 16,996 tons for the whole island.

The rainfall in 1925 was poor the average for 63 stations being 30.75 inches as compared with an average for 53 years of 43.05 inches. As a consequence of this the output of sugar in 1926 was considerably less than in 1925. viz., 10.522 tons by the Antigua Sugar Factory and 1,674 tons by Bendals.

In 1926 the rainfall particularly during the latter months of the year was excellent—the average annual rainfall for 70 stations being 50.20 inches. 7.15 ins. in excess of the average for the past 53 years. Favourable weather moreover continued throughout the early part of 1927 resulting in the production in that year of the largest crop ever recorded for Antigua 23,195 tons. The price also was more favourable than had been the case for some years past averaging £16 per ton so that 1927 may be regarded as one of the few bumper years of this Presidency.

SUGAR CANE EXPERIMENTS.

During 1925 the scheme for the Antigua Sugar Cane experiments was completely reorganised to meet the expressed wishes of certain of the planters in the Island. Prior to this date it had been customary to plant a large number of varieties (30—40) on 1/40 acre plots at each of eight or more experimental stations scattered throughout the Island.

In the scheme adopted in 1925 only three experimental stations were planted each year, one on each of the three main types of soil in the island and moreover a limited number of varieties were grown at each station on ¼ or ⅕ acre plots. Full details of these experiments will be found in the annual reports on Sugar Cane Experiments in the Leeward Islands for the years 1925—26, 1926—27 and 1927—28.

The experiments were discontinued in 1927—that is to say no new plots were planted for reaping in 1929. While it is unfortunate that the continuity of the Antigua Sugar Cane Experiments should have been broken it is hoped to start a new syystem of varietal experiments with replicated plots as soon as the staff of the Department can be sufficiently strengthened to undertake the extra work involved in the execution of such experiments. These are now generally regarded as the only type of field experiments whose results possess a real significance.

COTTON.

From the season 1913-14 when 1,282 acres were planted under cotton there was a steady decline in the acreage under this crop until in 1924 only 145 acres were planted. In 1925 however there was a distinct increase. It is on record that 482 acres were planted but there is reason to believe that the actual acreage under cotton was considerably in excess of this figure.

In 1926 again the cotton area was greatly increased but unfortunately the unusually wet weather which produced the bumper cane crop of 1927 favoured the cotton worm and caused considerable boll shedding while the excessive vegetative growth of the plants and consequent lateness of maturity exposed the bolls to an excessive infestation of the pink boll worm and the crop was a poor one. The result of this was again a curtailment of the area planted under cotton in 1927—the acreage being only 247 acres.

The quantities of cotton products exported during the three seasons under review are shown in the following table:—

	Cotton Lint.	Cotton Seed.
1925 (1924-25 crop)	37,250 lb	* Nil.
1926 (1925-26 crop)	123,900 lb	103,600 lb
1927 (1926-27 crop)	116,400 lb	310,400 lb

Progress in Minor Industries

The Lime Industry.

The drought of 1925 militated against any progress in this industry. Only 500 gallons of concentrated juice were exported for the year in question.

In the following year however under the influence of good rains heavier crops of limes were produced and the exports of concentrated juice totalled 2,050 gallons. There were also exported in this year 87 barrels of green limes.

In 1927 a still further marked improvement took place in the lime cultivations and the exports of concentrated juice rose from 2,050 gallons in 1926 to 5,205 gallons. In addition 144 gallons of distilled lime oil valued at £1,620 were shipped to the United States of America.

The lime industry is expanding gradually and large orders for lime seedlings have been placed with the Department.

There are considerable acres in the southern parts of Antigua in which the lime industry could be extended with profit—districts with a rainfall above that of the average for the island and sheltered from wind. In this connection it is of interest to note that Dr. Briton Jones, Professor of Mycology at the Imperial College of Tropical Agriculture is of opinion that even if wither-tip of limes was introduced into this Island the climatic conditions are too unfavourable for it ever to become the serious scourge it is in the wetter islands such as Dominica, Trinidad and St. Lucia.

THE ONION INDUSTRY.

During 1925 the onion crop was very much in excess of the previous year but prices were unremunerative and growers became discouraged. Consequently in 1926 the acreage under this crop was substantially decreased. The crop was so small that the Onion Growers Association did not function as a distributing centre. Only 46,750 lb. of onions were exported in this year.

In 1927 the quantity of onions shipped amounted to 66,500 lb. showing a slight increase over the previous year.

THE COCONUT INDUSTRY.

There is little or no improvement to report in this industry from the estate point of view.

Owing to the generosity of Mr. T. B. Macaulay, President of the Sun Life Assurance Company of Canada, 4,000 nuts were purchased during 1927 germ-

* All the seed produced in 1925 was crushed and used locally for feeding stock.

inated by the Agricultural Department and distributed among the various districts and villages of the island. It is proposed to distribute a further 2,000 plants to peasants during the coming year.

SEED WORK.

The seed work industry has steadily declined and in the absence of ready sales little or no interest is now centred in this once fairly important minor industry.

EFFORTS IN CONNECTION WITH AGRICULTURAL PROGRESS. SHIPMENT OF SWEET POTATOES TO CANADA.

During the period under review the question of the development of an export trade between Antigua and Canada in sweet potatoes received considerable attention.

Several shipments of sweet potatoes were made through the Agricultural Department to various private firms but the first shipments were unfavourably reported upon as they did not meet with the requirements of the Canadian market which was accustomed to the New Jersey type of potato—a round medium sized yellow potato which when cooked resembles a pumpkin somewhat in colour and is sweet, soft and moist.

Later a hamper of sweet potatoes of the New Jersey type was obtained from Canada and was shown to planters to illustrate the type of potato required, the grading packing and container used. These potatoes also served as planting material and enabled some quantity of the New Jersey potatoes to be grown locally.

Unfortunately under Antigua conditions this variety tended to form long and unevenly shaped tubers instead of the round forms required for the Canadian market resulting in considerable wastage during grading. Trial commercial shipments were however made through a local firm but the results of these shipments were not particularly encouraging as it appears that the demand for sweet potatoes is more or less limited to the period September—November and even at this time there is considerable competition from sweet potatoes grown in various parts of the Southern United States of America and in Japan and other Asiatic countries.

SPECIAL DUTIES PERFORMED BY AGRICULTURAL OFFICERS.

During the period under report the following work was performed by the Department:—

1. A hedge of *Yucca aloifolia* was planted around the grounds of the Government property where the present Chief Justice resides.
2. A tennis lawn was laid out, built up to a considerable height and planted with devil grass (*Cynodon dactylon*).
3. A flower garden was planted in front of the building in question.
4. Planting up decorative material along the hill sides and surrounding lands at Fiennes Reservoir at Swetes.
5. The War Memorial grounds have been placed under the care of the Department.
6. Planting and caring avenue of decorative trees leading to Hospital.

7. Planting of decorative plants in Government House gardens.

8. Planting of a piece of land at south entrance to City in flowering shrubs, hedges and keeping same in order since.

9. Repairs carried out to wooden bridges at Swetes reservoir.

10 Renovation or re-making of two lawns at Government House.

11. Digging and sifting mould from Scots Hill for Government House lawns and gardens.

12. Keeping garden and hedges at Fiennes Wells at Bendals clean and tidy.

13. Decorating western lawn in Botanic station with electric lights and flags for Empire Day celebrations 1926 & 1927.

14. Planting, supply and keeping clean avenue of flamboyant trees at Camacho avenue.

15. Repairing road around the Botanic Station.

16. Planting clumps of flamboyant trees in Hospital grounds and on south side of Rat Island facing harbour and keeping same clean and watered.

17. Transplanting cedar trees over 12ft. in height to spots of land outside Government house to make the latter private.

18. Transplanting large White Cedars and white wood on southern border of St. John's Cricket ground.

19. At the instance of His Excellency the Governor Fort James has been transformed into one of the "Beauty Spots" of Antigua. Work of planting up decorative shrubs and trees at the fort began in December, 1927, and continues to the present time.

The Antigua Cotton Growers' Association.

The working of the association was carried out under the same board of management with the exception of the Honorary Secretary, whose place has been taken by the present Agricultural Superintendent. Several meetings of the board were held and matters pertaining to the advancement of the cotton industry dealt with.

During the period under review arrangements were made for the actual purchase of peasants cotton which had hitherto been carried out at the Botanic Station by the staff of the Agricultural Department on behalf of the Association to be made by the Antigua Cotton factory. Each year the Association advanced to the factory at the usual rates of interest a sum to cover purchases during the season. The rates of first payment was decided by the Association and as in previous years three quarters of the profits on the sale of the cotton was handed to the growers as a bonus but the remainder was retained by the Factory instead of by the Association.

The financial work of the Association and the payment of bonus were carried out by the officers of the Association.

DETAILS OF ADMINISTRATION.

The expenditure and receipts for the period under review are as follows:—

Years.	Expenditure.	Receipts.
1925—26	£1,385 15 11	£88 13 11
1926—27	1,792 2 1	67 2 11
1927—28	1,564 19 2	45 12 8

LAND SETTLEMENT AND CROWN LANDS.

Considerable attention was paid to work in connection with the land settlement schemes at Sawcolts, Clare Hall and Wallings. During the period 1925-27 the following sums of money were received as instalments from these three districts.

Sawcolts ..	£169 0 0
Wallings ..	28 16 4
Clare Hall ..	376 10 7
	£564 6 11

There are 88 allotments at Sawcolts of which number twenty-six have been paid for in full.

There are 122 allotments at Clare Hall three of which have peen paid for in full.

At Wallings there are 11 allotments. This is the most recently established settlement and none of the allotments have so far been fully paid for.

At Piccadilly 94 tenants rent in all 80 acres. At Skerrets 14 tenants rent 91 acres and at Body Ponds 41 tenants rent in all 41 acres. The sums collected from these districts during the period under review are:—

Piccadilly ..	£114 11 6
Skerretts ..	95 6 9
Body Ponds ..	58 9 6
	£268 7 9

EXHIBITIONS.

Successful Agricultural Shows were held in 1925, 1926, 1927 and 1928 and in 1924 and 1925 exhibits were collected, packed and despatched to the British Empire Exhibition at Wembley.

CORRESPONDENCE.

The number of letters dealt with during the period under report were as follows:—782 in 1925, 959 in 1926 and 697 in 1927. In addition numerous minute papers were dealt with.

OFFICIAL VISITS.

His Excellency Sir Eustace Fiennes, Bart., Governor and Commander of the Leeward Islands Colony visited the Botanic Station on several occasions.

The Superintendent of Agriculture for the Leeward Islands visited the Botanic and Experiment stations on several occasions.

Professor H. A. Ballou, O.N., M.Sc., also visited the Botanic Station and other Experiment Station and plots.

Other visitors included Professor Matze, Professor J. Briton Jones, Mycologist on the staff of the Imperial College of Tropical Agriculture.

METEOROLOGICAL SUMMARY 1924.

KEPT AT THE BOTANIC STATION, ANTIGUA.

Month.	Thermometer.								Barometer Reading.		Wind.			Rainfall. Botanic Station.	Barometer Corrected.		Thermometer.	
	Dry.		Wet.		Relative Humidity, per cent.		Maximum.	Minimum.	9 a.m.	3 p.m.	Miles run.	Average.			Highest.	Lowest.	Highest Max.	Lowest Max.
	9 a.m	3 p.m.	9 a.m.	3 p.m.	9 a.m.	3 p.m.						Per day.	Per hour.					
January ..	79·4	80·3	73·4	74·5	72·1	72·6	82 3	73·2	30·081	30·007	6,980	290·9	9·3	2·28	30·160	29·946	85	70
February ..	79·6	80 3	74 2	75·5	72·9	70·3	83·8	...	30·075	29·996	4,415	186 7	6 3	1·18	30 162	29·935	87	...
March ..	81·6	83·8	74·6	75·3	68·3	63 1	86·9	...	30·019	29 956	3,300	106·0	4·4	0·46	30·131	29·805	90	...
April ..	82 3	84·1	76·8	77·2	75·3	72·6	87·8	...	30·014	29·934	3,060	102·0	4·2	2·09	30·067	29·877	91	...
May ...	82·7	82·7	78·3	79·4	81 9	75·7	87·0	...	30 012	29·945	4,915	152-0	6·5	4·16	30·070	29·867	90	...
June ...	82·4	84·5	78·2	79 9	80·0	78 0	86·5	...	30·017	29·974	6,050	201·6	8·4	3·16	30·075	29·914	89	...
July ...	83·5	85·1	79·5	79·5	80·5	74·2	86·8	...	30·020	29·931	6.125	235·6	9·8	4·09	30·101	29·946	98	...
August ...	82 6	83 9	79 1	79·7	82·7	80·3	86·6	...	29·975	29·901	6,830	220 3	8·1	9·64	30·068	29·520	80	...
September...	83.1	83·3	78·3	78·6	77·6	74·9	86·6	...	29·980	29·907	3 240	1·7·7	4·6	5·36	30·086	29·855	90	...
October ...	83·1	83 9	78·3	78·4	77·0	74·5	86·7	74·3	29·353	29·876	3,100	100 0	4·1	6·62	30·031	29·802	90	70
November ...	81·9	82·5	77·5	77·4	79 0	74·3	85·1	72·3	29·949	29·882	3,675	122·5	4·9	4·70	30·015	29·784	90	68
December ...	79·5	80·4	74·5	75·3	72·5	76·5	82·9	70·3	30 051	29·960	5,300	220.8	9·2	5·79	30·134	29·902	86	65
											56,990			49·83				
Means for the year.	81·7	82·9	76·9	77·6	76 6	73·9	85·8	72·5	30 012	29·939		171·4	6·6					

Highest Maximum Temperature = 91° on 16th April.
Lowest Minimum „ = 65° on 28th & 29th December.
Highest Parometer (corrected) = 30·162 on 7th February.
Lowest „ „ = 29·520 „ 28th August.
Greatest Rainfall in 24 hours = 3·03 ins. on 27th August.

Greatest number of miles run by Wind in 24 hours = 855 miles on 27th August.
Hurricane = A severe hurricane passed over the Colony of the Leeward Islands on 28th August very little damage was done in Antigua but considerable damage was done in St. Kitts, Nevis Montserrat, Tortola.
Earthquake recorded = 4 ; on 18th and 19th April 17th and 31st July
Thunderstorms = 1 ; on 1st November.

METEOROLOGICAL SUMMARY 1925.

KEPT AT THE BOTANIC STATION, ANTIGUA,

Month.	Thermometer.								Barometer Reading.		Wind.			Rainfall Botanic Station.	Barometer Corrected.		Thermometer	
	Dry.		Wet.		Relative Humidity per cent.		Maximum.	Minimum.	9 a.m.	3 p.m.	Miles run.	Average.			Highest.	Lowest.	Highest. Max.	Lowest Min.
	9 a.m.	3 p.m.	9 a.m.	3 p.m.	9 a.m.	3 p.m.						Per day.	Per hour.					
January ...	78·4	79·9	73·2	74·8	72·5	75·9	81·6	70·0	30·114	30·039	6,870	221·8	9·2	2·43	30·187	29·972	84	65
February ..	78·4	79·9	72·4	72·8	71·4	70·2	82·9	67·6	30 037	29·949	2,985	106·6	4·5	2·41	30·085	29·863	85	64
March ...	80·5	81·4	72 2	72·6	62·9	61·6	84 2	75·6	29·993	29·926	4 350	140·3	5·8	0·94	30·105	29·814	90	62
April ..	82·2	81·1	74·8	74 9	66·5	60·8	87 0	73·2	29·994	29·910	4 725	157·5	6·5	1·18	30 077	29 868	92	66
May ..	82·7	84·1	77·7	75·7	70·9	63.5	87·4	72·4	30·030	29 967	6,325	204·0	8·6	1·65	30·117	29·912	91	70
June ...	83·8	85 0	78·7	78·5	73·3	71 0	87·6	74·6	30·033	29·982	7,150	238·3	10·0	0·84	30·073	29 928	92	70
July ...	83·1	81·0	78·5	79·0	81·4	71·0	86·3	75·9	30·036	29·980	6,500	209·7	8 7	8·25	30 085	29·907	89	70
August ..	84·3	85·0	79·0	78·9	75·4	73·7	86·9	75·2	30·004	29·918	7,030	226·8	8 7	3·18	30·048	29·909	90	72
September ..	83 6	81·7	78·2	79·0	71·7	73·7	87·5	74·8	29·963	29·896	4,750	163·8	6·8	4·41	30·032	29·837	92	71
October ..	83·5	83 6	76·9	77·3	70·3	71·5	87·3	73·4	29·982	29·891	4,775	154·0	6·4	5·91	30·061	29·822	92	70
November ...	82·3	82·8	75·6	76·3	70·9	70·1	84·8	72·3	29·980	29·899	4,050	135·0	5·6	3·49	30·047	29·814	87	60
December ...	80·3	82·4	74·7	75·4	70·9	68·5	84·3	71·6	30·034	29 960	4,425	142·7	5·9	1·69	30 093	29·903	88	69
											63,935			36 41				
Means for the year.	81 9	83·0	75·9	76·2	72·0	69·6	85·6	73 1	30·016	29·945		175·0	7·2					

Highest Maximum Temperature = 92° on 30th April, 1st June, 30th September 1st October.
Lowest Minimum Temperature = 60° on 1st November.
Highest Barometer (corrected) = 30·187 on 21st January.
Lowest „ „ = 29·814 on 10th March and 6th November.
Greatest Rainfall in 24 hours = 5 30 ins. on 5th July
Greatest number of miles run by Wind in 24 hours = 350 miles on 4th and 11th June.
Earthquakes recorded = 7 ; on 25th February, 9th March, 1st September 2nd 19th and 2 on 20th November.

METEOROLOGICAL SUMMARY 1926.

KEPT AT THE BOTANIC STATION, ANTIGUA,

Month.	Thermometer.								Barometer Reading.		Wind.			Rainfall Botanic Station.	Barometer Corrected.		Thermometer	
	Dry.		Wet.		Relative Humidity per cent.		Maximum.	Minimum.	9 a.m.	3 p.m.	Miles run.	Average			Highest.	Lowest.	Highest. Max.	Lowest Min.
	9 a.m.	3 p.m.	9 a.m.	3 p.m.	9 a.m.	3 p.m.						Per day.	Per hour.					
January ...	79·6	81·3	73·5	74·2	70·1	67·1	83·3	71·1	30·072	29·994	7,050	227·4	9.4	2·09	30·135	29·915	86	68
February ...	79·5	81·4	73·2	73·3	70·5	64·1	84·0	71·3	30 062	29·981	5,375	173·4	7.9	3·23	30·129	29·883	88	65
March ...	80·0	83 0	73·4	74·4	69·0	62·3	85·3	71·0	30·065	29·980	4,900	160·0	6·5	0·56	30·203	29 863	89	67
April ...	81·7	82·5	75 0	75.8	69·5	68·8	85·6	72·6	30·073	30·005	5,909	196·7	8·2	2·73	30 157	29·969	89	69
May ...	83·1	84·5	77·4	78·5	73.3	73·9	86·9	74 2	30·003	29·899	3,875	125·0	5·3	4·46	30·122	29·779	91	69
June ...	83·1	84·4	76·5	76·3	70·0	65 0	86·5	74·0	30·025	29·965	6,275	209·1	8·3	3·57	30 064	29 900	89	71
July ...	83·7	84·6	78·3	78·0	74·9	70·2	87·0	75·5	29 989	29 928	6,250	201·6	8·3	5·77	30·100	29 800	89	71
August ...	83·9	84·8	78 3	78·1	73·7	70·3	87·3	75·1	30 011	29·953	6,300	203·2	8·5	10·65	30·082	29·880	92	72
September ..	84·8	85·0	78·2	78·4	71·6	69 8	87 9	75·2	29·931	29·853	3,500	116·6	4·9	11·02	30·057	29·720	92	70
October ...	82 7	83·7	77·7	78·4	76·3	72·9	86·1	73·9	29·933	29·854	3,222	103·9	4·2	7·20	29·990	29·749	89	70
November ...	81·9	82·7	76·4	76·4	74·3	70·9	85 2	74·0	29·937	29·857	4,075	135·8	5·6	5·36	30·043	29·782	88	71
December ...	80·0	81·1	74·5	74·6	73·7	69·8	83·0	71·4	29·950	29·843	5,100	164·5	6·8	2·59	30·070	29·833	85	70
											61,822			59·23				
Means for the year.	82·0	83·3	76·1	75·6	72·2	68·8	85·7	73·3	30 004	29·926		168·1	6·9					

Highest Maximum Temperature = 92° on 3rd and 4th August, 8th September.
Lowest Minimum Temperature = 65° on 7th February.
Highest Barometer (corrected) = 30·203 on 14th March.
Lowest " " = 29·720 on 14th September.
Greatest Rainfall in 24 hours = 4·89 ins. on 13th September.
Greatest number of miles run by Wind in 24 hours = 750 on 20th August.
Earthquakes recorded = 5; on May 17th, August 19, 22, 30, September 14th.
Thunderstorms = 6; on May 7th, August 13 and 15th, September 13th, October 4th, 14th.

METEOROLOGICAL SUMMARY 1927.

KEPT AT THE BOTANIC STATION, ANTIGUA.

Month.	Thermometer.								Barometer Reading.		Rainfall. Botanic Station.	Barometer Corrected.		Thermometer.	
	Dry.		Wet.		Relative Humidity, per cent.		Maximum.	Minimum.	9 a.m.	3 p.m.		Highest.	Lowest.	Highest Max.	Lowest Max.
	9 a.m	3 p.m.	9 a.m.	3 p.m.	9 a.m.	3 p.m.									
January ...	73·7	80·6	73·0	73·7	71·8	68·3	82·6	69·1	30·041	29·979	3·62	30·097	29·950	85	65
February ..	79·0	80·1	72·6	71·9	69·9	63·4	82·8	68·7	30·080	30·005	1·42	30·165	29·961	85	66
March ...	78·7	80·3	72·4	73·1	74·3	67·5	82·9	69·6	30·017	29·973	5·50	30·096	29·935	86	67
April ...	80·3	81·2	74·7	74·4	73·4	69·8	83·3	70.8	29·964	29·915	5·81	30·077	29·852	89	69
May ...	82·1	83·2	75·9	76·0	70·3	67·7	85·3	73·5	30·031	29·988	4·85	30·109	29·828	88	70
June ...	82·4	82·9	76·7	76·5	71·9	71·7	82·2	73·7	30·039	29·992	4·17	30·095	29·903	88	68
July ...	83·0	84·1	74·1	77·0	73·9	67·6	86·5	73·3	30·039	29·989	6·90	30·117	29·887	89	68
August ...	84·6	85·8	78·6	77·6	71·0	61·9	87·8	73·8	29·937	29·920	2·06	30·030	29·853	90	70
September...	85·5	85·7	78·5	77·3	69·1	64·0	89·2	73·6	29·925	29·857	4·92	29·977	29·825	91	71
October ...	83·8	83·7	77·8	76·6	73·2	68·6	87·8	73·3	29·956	29·892	6·89	30·022	29·735	90	70
November ...	81·4	81·6	76·3	75·2	76.5	72·7	84·6	71·9	29·916	29·834	8·69	30·013	29·727	88	68
December ...	80·6	81·6	73·5	74·2	66·7	65·6	80·1	73·0	29·974	29·904	1·21	30·135	29·875	87	68
											56·07				
Means for the year.	81·7	82·6	75·4	75·3	71·8	67·7	84·6	72·0	29·996	29·938					

Highest Maximum Temperature = 91° on 9, 12, 13, 14, 16, 19, 25 September 1927.
Lowest Minimum Temperatu re = 65° on 24th January, 1927.
Highest Barometer (corrected) = 30·165 on 12th February 1927.
Lowest " " = 29·727 on 18th November, 1927.
Greatest Rainfall in 24 hours = 1·84 on 28th October, 1927.
Thunderstorms = 2; 13th and 22nd April, 1927.

AVERAGE RAINFALL.—1874—1927.

1874	the	average	rainfall	on	41	stations	was	31 16
1875	"	"	"	"	40	"	"	28.78
1876	"	"	"	"	36	"	"	41.98
1877	"	"	"	"	38	"	"	49.05
1878	"	"	"	"	53	"	"	47.11
1879	"	"	"	"	52	"	"	61.54
1880	"	"	"	"	46	"	"	49.68
1881	"	"	"	"	44	"	"	53.75
1882	"	"	"	"	45	"	"	33.04
1883	"	"	"	"	56	"	"	55.51
1884	"	"	"	"	56	"	"	43.98
1885	"	"	"	"	53	"	"	43.39
1886	"	"	"	"	55	"	"	47.78
1887	"	"	"	"	50	"	"	43.68
1888	"	"	"	"	47	"	"	44.23
1889	"	"	"	"	50	"	"	73.59
1890	"	"	"	"	45	"	"	33.00
1891	"	"	"	"	45	"	"	50.01
1892	"	"	"	"	53	"	"	38.43
1893	"	"	"	"	54	"	"	38.69
1894	"	"	"	"	68	"	"	38.85
1895	"	"	"	"	69	"	"	52.91
1896	"	"	"	"	56	"	"	59.85
1897	"	"	"	"	54	"	"	39.67
1898	"	"	"	"	66	"	"	48.85
1899	"	"	"	"	63	"	"	47.50
1900	"	"	"	"	64	"	"	36.95
1901	"	"	"	"	65	"	"	57.61
1902	"	"	"	"	71	"	"	58.80
1903	"	"	"	"	68	"	"	42.68
1904	"	"	"	"	70	"	"	37.01
1905	"	"	"	"	68	"	"	31.40
1906	"	"	"	"	66	"	"	53.93
1907	"	"	"	"	70	"	"	43.45
1908	"	"	"	"	72	"	"	43.79
1909	"	"	"	"	70	"	"	45.15
1910	"	"	"	"	70	"	"	34.77
1911	"	"	"	"	72	"	"	36.47
1912	"	"	"	"	72	"	"	32.20
1913	"	"	"	"	73	"	"	42.76
1914	"	"	"	"	72	"	"	36.86
1915	"	"	"	"	75	"	"	56.14
1916	"	"	"	"	74	"	"	58.23
1917	"	"	"	"	70	"	"	36.62
1918	"	"	"	"	70	"	"	37.87
1919	"	"	"	"	70	"	"	49.56
1920	"	"	"	"	70	"	"	30.09
1921	"	"	"	"	74	"	"	30.32
1922	"	"	"	"	70	"	"	35.14
1923	"	"	"	"	68	"	"	32.41
1924	"	"	"	"	67	"	"	41.57
1925	"	"	"	"	68	"	"	30.75
1926	"	"	"	"	70	"	"	50.20
1927	"	"	"	"	67	"	"	45.84

The average rainfall for 54 years is 43.92 inches, so that the rainfall for the year 1927 is 1.92 inches above the average.

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